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ECONOMICS OF MILK PRODUCTION IN ALBERTA, 1985

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By
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FOREWORD

Pricing of fluid milk in Alberta is regulated by the Public Utilities Board (PUB). The Production and Resource Economics Branch conducts an annual study of dairy production costs and returns in Alberta to assist the PUB in administering fluid milk prices. This annual Dairy Cost Study was introduced during World War II and is now recognized by dairymen, consumers and the PUB as the primary reference for setting fluid milk prices.

In addition to the Dairy Cost Study, the branch has developed a computerized formula which monthly monitors producer costs. The formula enables the PUB to make more frequent adjustments to the producer price in response to increasing production costs during the year. Further adjustment to the producer price can be made when the annual Dairy Cost Study is completed.

The 1985 cost per hectolitre of fluid milk increased marginally (4.3%) compared to decrease of 1.5 per cent in 1984. The increase occurred in almost all cost categories. Relatively stable income due to a reduction in herd credit and higher over quota levy payments resulted in decline in producer returns to equity from 12.9 per cent in 1984 to 11.0 per cent in 1985.

Dr. Carlyle Ross, Head
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NOTE

This report was prepared from farm records of a selected number of fluid milk producers in Alberta who voluntarily participated in this project. Their participation was greatly encouraged by the Alberta Fluid Milk Producers' Association. The Alberta Dairy Control Board provided the financial compensation to the participating producers. Allan Presiznuk from Production and Resource Economics Branch collected and assisted with the computerization of the farm data and has maintained personal contact with the producers throughout the year.

Rudy Susko

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I. INTRODUCTION

This study is an annual economic analysis of milk production on Alberta farms. Prior to 1974 the findings of these studies were used as the documented evidence at the Public Utilities Board hearings to set the producer price. Although a formula pricing system was adopted in November 1974 the significance of this study in overall pricing mechanism, remains undiminished.

More specifically the objectives of the study are:

- to provide a continuing account of the costs and economic conditions encountered in the production of fluid milk in Alberta.
- to annually monitor the performance of the fluid milk formula pricing.
- to use the findings as a basis for the revision in the formula price.
- to provide the data for the extension use e.g. credit, farm management.
- to provide the participating dairy farmers with a personal business analysis for management purposes.

The cost of production account is a vital economic indicator in milk pricing because of the supply management nature of the industry.

II. METHOD OF ANALYSIS

Many approaches may be used to establish the cost of production on the farm. The approach taken in this study is to show the actual cost outlays taken from the farm records for a given production year. A computer program is utilized to summarize the data and calculate the weighted group averages.

The study emphasizes the overall provincial situation supported by the regional data. Since the study is annual and ongoing, the current year is compared with the previous year to make the results more meaningful. Using this approach, the information is expressed in production units such as per hectolitre of milk and per cow.

Preliminary quarterly analyses are made during the year to observe seasonal effects. However, emphasis is on the full year's operation.

1. Enterprise Identification -- There are many accounting approaches for calculating the farm cost of producing fluid milk. Some use the total farm approach, with dairy costs intermingled with others. Others use the different imputed cost items such as operating interest cost or management charge. In Alberta the dairy enterprise is defined as all activities associated with milking cows, dry cows and young dairy stock. In most cases, the dairy operator raises his own feed; the inputs of production are allocated to the dairy enterprise and the total farm according to the actual use. Consequently, the final costs of producing milk are the true costs associated only with milk production.

2. Inventory Adjustment -- Since the cost of raising young dairy stock is included in the cost of milk production, the total income includes net cattle sales and net inventory increases to show the herd growth. The cattle inventory increases are determined by subtracting the beginning year inventory from the year-end inventory. The gross income is thus composed of milk sales and inventory adjustment. If the inventory adjustment per hectolitre of milk is excluded from the income the result is the blend price and subsidy received for milk.

3. Home Grown Feed -- The hay grown on the farm and fed to dairy livestock is valued at regional values of hay in the stack on the farm; feed grain is valued at elevator prices provided by the Alberta Grain Commission. Although hay and grain could be grown on the same farm, both are considered to be purchased from the crop enterprise. The total value of home grown feed is determined by applying the regional price to the actual quantity fed. The procedure adequately compensates for the production cost of growing home feed. The cost of purchased feed is accepted at the actual value spent each month.

4. Value of Investment and Depreciation -- The cost of production and other relevant data from this report are supposed to reflect the average conditions in the industry. The value of depreciation is based on the original value of buildings and machinery. There is also a need to estimate the current market value of the facility to determine the equity position. The market value is computed from the original value of dairy capital by updating with the inflation factors and then depreciating according to the number of years in use. This value is used for calculating the return to equity. The age of the facility is indicated by the sample of participating producers representing the total industry. The farmland is not considered as a dairy investment. Only the acreage for dairy buildings and corral location is included in the dairy. The dairy livestock inventory is valued at the prevailing market prices at the beginning of the year.

5. Imputed Costs -- There are two basic alternatives to value the economic well being of the farm enterprise. A. to determine the return to family labour including the operator labour input, and B. to determine the return to equity invested in each particular enterprise. The methods, as identified in Table 1, are quite compatible and in each case some major assumptions must be made. In alternative A where the residual is return to family labour, the equity interest must be imputed in order to arrive at the total cost of production. The actual residual can then be measured in terms of

dollars per hour of labour. On the other hand, using alternative B, the value of family labour must be imputed since there is usually no value attached to this input.

In this study the principles of the alternative B are used, i.e. the objective is to determine the percentage return to equity The imputed value of family labour is included in the operating or variable costs. This is more practical for a number of reasons: i) incorporated farms usually allocate total labour expenses including family, ii) in reality the operator is using money during the year for living expenses and thus the imputed family labour value is compensating for this, iii) imputed interest or opportunity cost on equity, used in alternative A is a controversial issue in the period of persistent inflation of capital assets. The charges for rent are included in the cost of capital. The capital cost in this context represents the cost of ownership of resources. If resources are rented there is a charge for their use; on the other hand if resources are owned the owner must bear the cost of depreciation and interest on debt. For group averages such classification of variable (or operating) and capital cost is very suitable.

a) Operator and family labour: the operator's actual labour may vary from almost nil on some dairy farms to the total input of labour on others. Our procedure has been to obtain a statement of the operator's labour in hours per month, then apply the rate paid for full time dairy labour (including room and board).

In determining the hourly value, 2500 hours is considered to be the working time for one man-equivalent in a 12-month period. By this method, it is felt that the process of valuing the operator's labour is equitable. This method is preferred over leaving it as a residual because of the great variability in labour time between operators. Family labour is evaluated similar to the above, but with different wage rates according to age and working responsibilities.

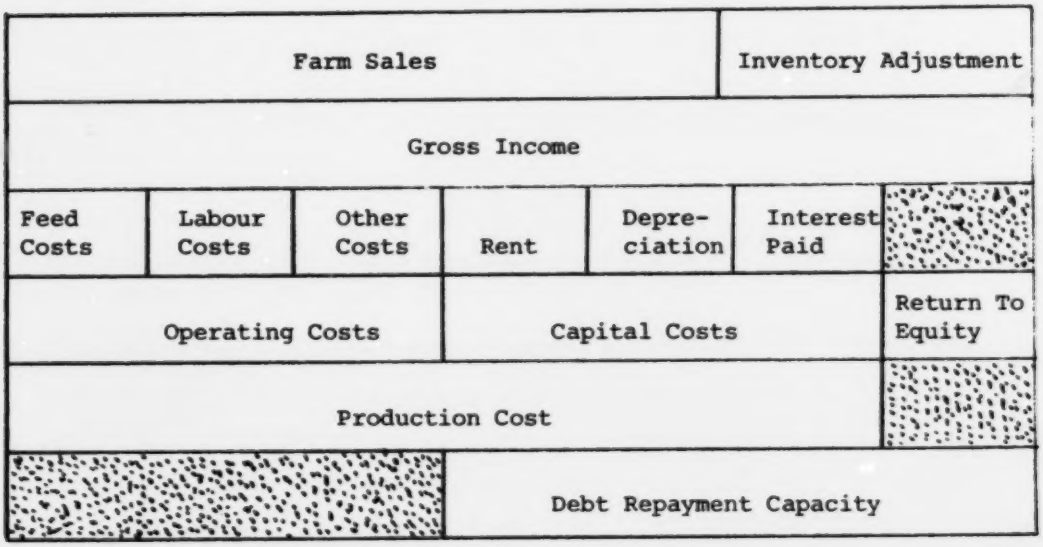
TABLE 1 ALTERNATIVE RETURNS

A. LABOUR		B. CAPITAL	
a)	Gross Income	a)	Gross Income
	Feed		Feed
	Other		Other
	Hired Labour		Hired Labour
	-		Family Labour (imputed)
b)	Operating Cost	b)	Operating Cost
	Rent		Rent
	Depreciation		Depreciaton
	Paid Interest		Paid Interest
	Equity Interest (Imputed)		-
c)	Capital Cost	c)	Capital Cost
	Return to Family Labour		Return to Equity

b) Interest on Capital: the actual interest paid on existing liabilities is included in the capital cost. To obtain this value, the participating producers were asked to report their outstanding liabilities and the interest rates they paid. This method is more accurate than reporting the annual interest payment sum. The total operating cost, plus the capital cost, account for total enterprise outlays and if subtracted from the gross income, the bottom line residual is the return on equity. The return on equity is not imputed but is left as a residual to measure the economic well-being of a farmer. If this residual is expressed as a percentage of the equity capital, then the actual return on equity could be compared with some alternative opportunity income which could be expected from Canada Savings Bonds or term deposits.

6. The production cost concept: The concept of cost accounting in farming is not the same in all provinces. In Alberta, the following production cost concept is used:

DIAGRAM 1



III. DATA COLLECTION

In order to obtain accurate dairy information from primary milk producers, all producers on the study are required to complete a detailed questionnaire of their dairy production activities each month. This questionnaire is shown in Appendix D of this report.

Research assistants collect the data, monitor the monthly collection and audit the data. This procedure ensures promptness in data collection and a minimum of recording error. The information is then entered into the computer. The computer output shown in Appendix A, B and C serves as supporting data for the report.

The analysis is based on data from fluid milk producers. Consequently the results indicate the cost level of producing fluid milk rather than industrial. The cost level for industrial milk might differ from fluid, but the difference is not substantial.

Fifty-nine dairy producers across the province submitted business information for the calendar year 1985. Two regions are recognized for the purpose of analysis. The region lying north of 39th township is called Northern Alberta and is represented by 39 producers; the region south of the 39th township is referred to as Southern Alberta and is represented by 24 producers. The producers submitted business accounts throughout the year.

Sample

While the number of participants can change because of unforeseen circumstances, the sample size is determined statistically every year. It was established that the variance of cost of producing milk in the population of fluid milk shippers was \$3.75/hL. The desired variation was assumed to be 20 cents. The sample size was then determined by:

$$n = \frac{4 \times s^2}{L^2} \div (1 + \frac{n}{N})$$

Where: n is sample size
N is population size
s is standard deviation of population
L is expected accuracy of sample.

The study was designed to represent a cross-section of the producers by the milk quota size. The provincial fluid milk shippers were arranged according to the quota size from largest to smallest in each of the two regions, Southern Alberta and Northern Alberta. The sample was selected by systematic sampling to provide better representation of the population. The average quota and herd size of the sample was 703 litres and 56 cows respectively. The sample size of 70 producers was determined to be statistically sufficient to represent the total population of fluid milk shippers. Out of that group 63 producers completed reports for the 12-month period needed for the study.

Production Conditions[1]

Poor pastures in the fall of 1984 forced many producers to begin feeding livestock much earlier than normal. Low hay yields, combined with the necessity to begin feeding early, caused serious feed shortages in the southern and eastern parts of the province.

Moisture levels last spring were considerably better than in 1984. However, high hay and straw prices caused producers to turn their livestock out to graze early resulting in slow pasture recovery.

By late May, many districts needed rain to improve the poor condition of native pasture and hay. Below average hay yields on the first cut caused producers to anticipate feed shortages, and some livestock began moving to market in late July. By this time, pastures were rated as poor to fair in most areas; conditions in the Southern and South Central Regions were rated poor.

Rain in late August and early September considerably improved pasture conditions. However, early frosts caused some concern over nitrate levels in greenfeed and many producers had their feed tested. September and October were generally cool and damp, causing harvesting

delays in most central and northern districts. An estimated 1.4 million acres of crop still remained in fields and resulting in some straw shortages.

The Alberta Livestock Drought Assistance Program and the Supplemental Alberta Livestock Drought Assistance Program were announced in the fall. Their purpose was to provide grants for Alberta livestock producers to help cover increased feed costs resulting from forage crop losses and the poor condition of native pastures. A one time payout of $75 per eligible breeding cow or equivalent is being made to all Alberta Livestock producers, regardless of location.

Statistics Canada estimated average provincial hay yields at 1.31 tons per acre, down from 1.79 tons in 1984. Yield estimates in the Southern Region varied from 0.5 ton/acre on dryland to 4.5 tons/acre under irrigation. The South Central Region reported estimates of 0.5 to 1.25 tons per dryland acre. North East and North West Regions reported hay yields generally from 1.7 to 2.25 tons/acre. In the Peace River Region, yields were 0.5 to 1 ton/acre, down from 2.25 to 2.5 tons/acre last year. Quality was reported fair to good in all Regions except the North West Region, where it was reported as good to excellent.

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[1] As reported by Statistics Branch of Alberta Agriculture.

IV. ANALYSIS OF RESULTS

Milk Prices

The program of supply management of fluid milk in Alberta is administered by the Alberta Dairy Control Board. Fluid milk quotas held by the producers are assigned by the Board to the processing plants. The minimum fluid milk prices at farm, wholesale and retail levels are established by an independent Board of Public Utilities (PUB). The PUB uses a fluid milk price formula to establish the monthly farm price. The retail price increases in 1985 which resulted from changes in the producer price as indicated by the price formula,[1] are shown in Table 2.

TABLE 2 FLUID MILK PRICE INCREASES IN 1985

Effective Date	Producer Price $/hL	Wholesale Price ¢/L	Retail Price ¢/L
December 31, 1984	49.11	79	83
March 1, 1985	50.09	80	84
September 1, 1985	51.07	81	85
Average	50.25	80.17	84.17

In 1985 fluid milk sales showed only a slight improvement over the previous year. The sales of 255.7 million litres were up from 254.0 million litres in 1984.

The utilization of assigned fluid milk quota in 1985 was 75.0 per cent compared to 74.3 per cent in 1984.

[1] The Alberta milk price formula was first adopted in November 1974; there was a major revision on July 1, 1980. A concise description of the formula is given in the Appendix E.

Fluid milk producers shipping milk in excess of designated Class 1 (fluid) milk received a $6.04 per hectolitre (hL) subsidy if the milk was covered by national market share quota. The subsidy was paid in addition to industrial milk prices. Of this subsidy, the Canadian Dairy Commission (CDC) held back a levy of $5.14 per hectolitre to pay some expenses of exporting dairy products. In addition to the levy, the CDC continued to impose a 30-cent skim-off levy on fluid milk deliveries.

The year 1985 was marked in Alberta, with unprecedented volume of overquota levy payments. These levies collected during the year are usually refunded depending on provincial quota situation on July 1 (dairy year end). In 1985, the refund was not as high as expected. Alberta exceeded its MSQ by 6.1 per cent, consequently the so-called net subsidy[2] was negative 65 cents per hectolitre on sample forms and influenced the final price received for milk.

At the conclusion of the year, there were 1,446 fluid milk shippers, 272 industrial milk shippers and 1,792 cream shippers in Alberta.

The diagram on the following page summarizes the quantity, price and utilization of milk in Alberta.

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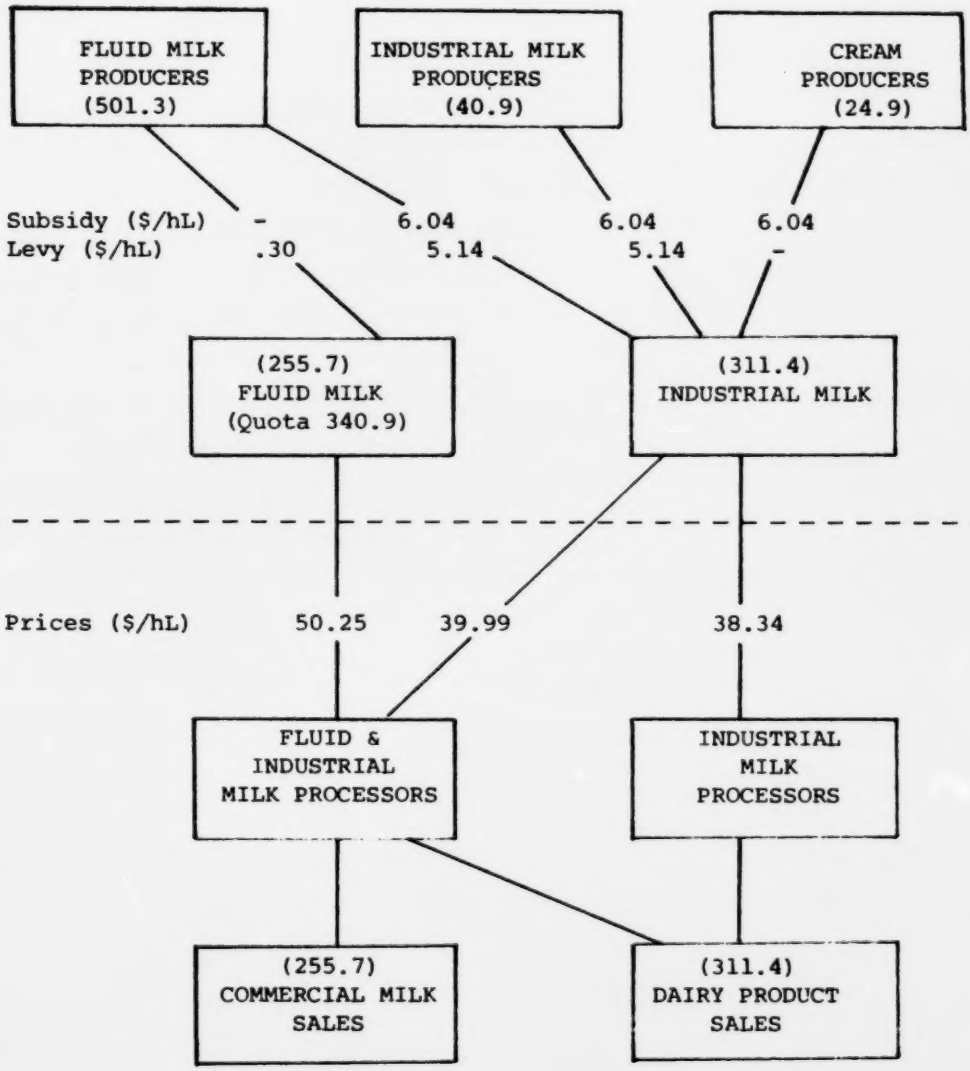
[2] Subsidy less levies.

DIAGRAM 2

- 1985 Milk in million litres
- Prices are 1985 averages



- Homogenized
- 2%
- Skim Milk
- Buttermilk
- Chocolate Milk
- UHT Milk
- 10% & Whipping Cream
- Eggnog

- Butter
- Powder
- Cheese
- Ice Cream
- Fluid Creams
- Concentrated Products

Input Prices

Table 3 shows the value and average price of the three most significant inputs: capital, labour and feed.

The market value of depreciable investment was calculated by using the inflation factor to update the original value of the asset and then depreciating according to the years of use.

Wages represent payment for the work required for the dairy enterprise. Fully paid family workers were considered to be hired labour. The wage rate for hired labour was the actual wage rate paid by participants in the study. Hired labour rates exclusive of family arrangements within the study sample as well as a random sampling of wage rates on dairy farms outside the study sample, were used to determine operator labour rates. The imputed value for an operator's labour in 1985 was $8.00 per hour. Compared with the previous year, purchased concentrate was used more than home-grown. The situation on roughage feeding was reversed. The use of family labour over hired help was less evident in 1985 than year before. The 1985 prices for grain and concentrate were lower than year before, while roughage prices were signifcantly higher.

TABLE 3 CAPITAL, LABOUR AND FEED VALUES

	Per Farm	Per Cow	Average Price
	- - - - - Dollars - - - - -		
Depreciable Investment	147,372	2,650	-
Livestock Investment	112,977	2,031	1,480/Cow
Total Investment	262,869	4,726	-
Grain & Concentrate Value:			
Home Grown (31%)	5,318	94.2	109.8/tonne
Purchased (69%)	20,191	357.5	185.0/tonne
Roughage Value:			
Home Grown (66%)	18,513	327.8	88.4/tonne
Purchased (34%)	11,460	202.9	105.8/tonne
Labour Value:			
Hired (34%)	8,876	159.6	5.99/hour
Operator & Family (66%)	20,146	362.2	7.02/hour

Income

Table 7 portrays the cost of producing milk for the dairy enterprise in Alberta; for comparison Table 8 and 9 display the results of Northern and Southern regions respectively. Gross income is the sum of milk sales and value for inventory adjustment. Although the fluid milk price has increased twice in 1985 the increases were somewhat diluted by higher levies. The sum of all subsidies less levies[1] was 48 cents per hectalire lower in 1985 compared to year before. The final blend price of $45.98 per hectalitre of milk sold, has increased by 115 cents or 2.6 per cent over the 1984 price. The fluid milk sale utilization of assigned fluid quota did not play a significant role in reduction of fluid price in 1985.

The gains in income per cow were significant in 1985 due to substantial increases in cow productivity from 5908 litres in 1984 to 6282 litres in 1985, a 6.3 per cent gain.

Inventory adjustment or the value for herd growth decreased in 1985 by $45.76 per cow to $153.09 or 2.54 per hectalitre. Cattle inventory reduction due to overquota situation was responsible for this trend. Total gross income per hectalitre of milk sold averaged $48.52, up from $48.30 in 1984.

Production Costs

The total production cost per hectalitre of milk increased in 1985 from $41.01 to $42.78, a moderate 4.3 per cent increase. The variable costs such as feed and labour, which account for 84% of total cost, increased by 2.5 per cent and the capital costs accounting for 14% of total cost increased more significantly by 14.8 per cent. Higher indebtedness of 1985 sample producers and newer equipment were responsible for higher interest payment and depreciation cost.

Despite the introduction of $21.00 feed grain assistance program and thus the reduction in concentrate feed cost in 1985, the total feed

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[1] Miscellaneous receipts comprise of other government assistance such as fuel rebates, green certificate, drought assistance.

cost increased by 3.7 per cent. Increases in hay price offset the benefits of the program. More efficient use of labour in 1985 was responsible for a slight decline in labour cost.

In 1985 debt accounted for 34 per cent of total assets, while this was 26 per cent in 1984.

TABLE 4 COST STRUCTURE

	Northern Region	Southern Region	Alberta
Feed Costs	31.9	39.3	35.1
Labour Costs	19.4	15.7	17.8
Other Costs	22.1	20.1	21.2
Capital Costs	14.0	14.1	14.1
Return	12.6	10.8	11.8
TOTAL (Per Cent)	100.0	100.0	100.0

Returns

The moderate increases in income coupled with increased cost resulted in somewhat deteriorated producer returns in 1985. The return to equity per cow has decreased from $446 in 1984 to $378 in 1985. This represents a decrease in return to equity from 12.9 per cent in 1984 to 11.1 per cent in 1985. Considering the bank's investment certificate rates or government bonds, the 1985 return on dairy farms was still favourable.

TABLE 5 RETURN TO CAPITAL		Per Cow
Total Dairy Investment	(100%)	$4,726.00
Debt	(34%)	$1,585.00
Equity	(66%)	$3,141.00
Paid Interest Rate		9.4%
Equity Interest Rate		11.0%
Profit per cent of Sales		11.8%

Other economic measurements of dairy farms in 1985: profit per cent of sales and return to family labour were also lower in 1985 over the year before. The profit per cent of sales was 11.8 in 1985, down from 16.1 in 1984 and the return to family labour of $6.44 per hour was down from $7.36 in 1984.

Although the returns in dairy farming are not excessive, the provincial supply of milk exceeded the expected requirements. By and large, the consumption responses to price change are inelastic i.e. the price changes can only partly alter the consumption level, although this is difficult to pin point due to other factors affecting the milk consumption.

Table 6 illustrates the acceptable total debt load per cow at various levels of milk production and interest rates. The basic repayment capacity is given by gross return i.e. money available for resource ownership payment, consisting of rent, depreciation, paid and equity interest ($789 per cow). This table should be used as a guideline only, each individual situation is different.

TABLE 6 ACCEPTABLE TOTAL DEBT LOAD PER COW

MILK PRODUCTION \ INTEREST RATE*	10 %	11 %	12 %	13 %	14 %	15 %
4,500 (L/cow)	4812	4501	4221	3970	3743	3538
5,500	5881	5501	5160	4853	4575	4324
6,000	6415	6000	5628	5293	4990	4716
6,500	6950	6500	6097	5734	5406	5109
7,000	7484	7001	6566	6176	5822	5503

* At 20 Years Repayment Period.

Price Formula Comparison With Cost Study Results

Table 10 compares the 1985 cost study with the results of the formula price. The composite index of the formula was responsible for an increase of 3.9 per cent in the Class 1 price, which in turn contributed to the increase in the effective blend price received by the producers. The supply factors of the formula increased by 5.2 per cent over the previous year, while the estimated cost of production increased by 4.3 per cent. Increases in production costs relative to the price and reduction in herd credit were primarily responsible for lower returns on dairy farms in 1985 compared to 1984.

TABLE 7 COST OF PRODUCING MILK

Alberta Average	1984	1985
No. of Cows	56.5	55.6
Milk Production Per Cow (L)	5908	62.82
Capital Investment per Cow ($)	4394	47.26
	Per Cow	
Milk Sales	2572.47	2776.11
Inventory Adjustment	198.85	153.09
A. GROSS INCOME	2771.32	2929.20
Concentrate	466.42	461.38
Roughage	475.81	566.87
Other Costs	526.63	590.02
Hired Labour	154.15	159.56
Family Labour	362.42	362.19
B. Variable Costs	1985.43	2140.02
Rent	17.11	24.18
Depreciation	200.31	238.66
Interest	122.58	148.15
C. Capital Cost	340.00	410.99
D. Production Cost (B+C)	2325.43	2551.01
GROSS RETURN	785.89	789.18
RETURN TO EQUITY	445.89	378.19
	Per hL of Milk Sold	
Milk Sales	44.83	45.98
Inventory Adjustment	3.47	2.54
A. GROSS INCOME	48.30	48.52
Feed Costs	16.42	17.03
Other Costs	9.66	10.29
Labour Cost	9.00	8.65
B. Variable Cost	35.08	35.97
Rent	0.30	0.40
Depreciation	3.49	3.95
Interest	2.14	2.45
C. Capital Cost	5.93	6.81
D. Production Cost	41.01	42.78
RETURN TO EQUITY	7.29	5.74
PER CENT RETURN TO EQUITY (%)	12.91	11.04

TABLE 8 COST OF PRODUCING MILK

Northern Alberta Average	1984	1985
No. of Cows	54.6	52.2
Milk Production Per Cow (L)	5768	6104
Capital Investment per Cow ($)	4444	4754
	Per Cow	
Milk Sales	2522.78	2712.25
Inventory Adjustment	201.58	163.76
A. GROSS INCOME	2724.36	2876.01
Concentrate	423.09	414.99
Roughage	457.35	503.01
Other Costs	509.24	599.32
Hired Labour	146.65	154.55
Family Labour	377.17	402.85
B. Variable Costs	1913.50	2074.72
Rent	18.46	21.88
Depreciation	204.81	242.94
Interest	108.02	138.50
C. Capital Cost	331.29	403.32
D. Production Cost (B+C)	2190.71	2478.04
GROSS RETURN	810.86	801.29
RETURN TO EQUITY	479.57	397.97
	Per hL of Milk Sold	
Milk Sales	44.70	45.86
Inventory Adjustment	3.57	2.76
A. GROSS INCOME	48.27	48.62
Feed Costs	15.60	15.52
Other Costs	9.55	10.72
Labour Cost	9.28	9.42
B. Variable Cost	34.43	35.66
Rent	0.33	0.37
Depreciation	3.63	4.11
Interest	1.91	2.34
C. Capital Cost	5.87	6.82
D. Production Cost	40.30	42.48
RETURN TO EQUITY	7.97	6.14
PER CENT RETURN TO EQUITY (%)	13.21	11.22

TABLE 9 COST OF PRODUCING MILK

Southern Alberta Average	1984	1985
No. of Cows	59.25	61.3
Milk Production Per Cow (L)	6097	6529
Capital Investment per Cow ($)	5327	4688.33
	Per Cow	
Milk Sales	2639.30	2864.46
Inventory Adjustment	195.19	138.34
A. GROSS INCOME	2834.49	3002.80
Concentrate	524.62	525.55
Roughage	500.62	655.17
Other Costs	549.99	577.16
Hired Labour	163.86	166.48
Family Labour	341.36	306.48
B. Variable Costs	2080.45	2230.84
Rent	15.30	27.37
Depreciation	194.32	232.72
Interest	142.54	161.74
C. Capital Cost	352.16	421.83
D. Production Cost (B+C)	2432.61	2652.67
GROSS RETURN	754.04	771.96
RETURN TO EQUITY	401.88	350.13
	Per hL of Milk Sold	
Milk Sales	45.00	46.16
Inventory Adjustment	3.33	2.23
A. GROSS INCOME	46.39	48.39
Feed Costs	17.48	19.03
Other Costs	9.81	9.73
Labour Cost	8.62	7.62
B. Variable Cost	35.91	36.38
Rent	0.26	0.44
Depreciation	3.31	3.75
Interest	2.43	2.61
C. Capital Cost	6.00	6.80
D. Production Cost	41.91	43.18
RETURN TO EQUITY	6.42	5.21
PER CENT RETURN TO EQUITY (%)	12.51	10.73

The results indicate that the change in cost indices used in the formula, is quite consistent with the actual cost changes found in the study. The deviation, if any, may be attributed to an inherent limitation of any formula indexing. For instance, lack of reflection of the production seasonality in hay purchases or the fact that the comparison was made in terms of the previous year only.

TABLE 10: COST OF PRODUCTION CHANGES RELATED TO CHANGE INDUCED BY THE FORMULA

(in $/hL)	1984	1985	%CHANGE	FORMULA INDEX CHANGE
Milk Price (PUB Class 1)	48.37	50.25	3.89	3.93[1]
Milk Price (Blend)	44.83	45.98	2.57	-
Inventory Adjustment	3.47	2.54	-26.8	-
Production Cost	41.01	42.78	+4.32	5.17[2]
Return to Equity	7.29	5.74		

[1] Composite Index

[2] Supply Index

Management Factors

Dairy management is concerned with the organizing, planning, directing and supervising of a dairy business. Dairy farmers carry out these functions. In addition, many farmers provide their own labour.

Table 11 shows average levels of the management factors which influenced income for the province. The figures from the previous year are included for comparison.

Productivity -- Milk production per cow in the 1985 sample increased by a substantial 6.3 per cent compared with 1984 production. The over-quota levies forced some producers to increase the culling and keeping high producing cows in production. The productivity of other resources

TABLE 11 MANAGEMENT INDICATORS IN MILK PRODUCTION

Alberta Average	1984	1985
A. Productivity		
Milk Production per Cow	5902.22 L	6282.00 L
Milk Production per Work Hour	74.38 L	86.29 L
Milk/Feed Ratio	2.14 L	2.22 L
Milk/Capital Ratio	1.34 L	1.33 L
B. Intensity		
Concentrate Fed per Cow	2.76 t	2.83 t
Roughage Fed per Cow	5.71 t	5.71 t
Investment per Cow	4394.22	4725.79 t
Acres per Cow	4.80	5.93
Labour Hours per Cow	79.44	78.24
C. Efficiency		
Cost/Revenue Ratio	0.85	0.88 t
Feed/Revenue Ratio	0.34	0.35 t
Labour/Revenue Ratio	0.19	0.18 t
Capital Turnover (years)	1.59	1.61 t
D. Rate of Returns		
Return on Equity (%)	12.91	11.04
Return to Family Labour ($/hr.)	7.36	6.44

such as labour and capital showed also improvements over the previous year. The number of litres of milk produced per hour of work was 80.3 in 1985. While milk produced per pound of feed has increased to 2.22 litres, the milk production per dollar of capital remained almost unchanged at 1.33 and 1.34 litres in 1985 and 1984, respectively.

Intensity -- The intensity of resource use measures the extent to which a farm resource has been used in production. It is commonly expressed on a per acre basis, but in the case of dairy farming, the appropriate unit is the cow. The results show that in 1985 the quantity of roughage fed was almost unchanged over the previous year, but the concentrate slightly increased. The capital value per cow in 1985 was 4726 per cow, up from 4394 in the previous year.

Efficiency -- The efficiency of prodution is measured in value of resource use per dollar of income received. In 1985, an average fluid milk producer spent 35 cents on feed and 18 cents of labour for each income dollar received. Total costs accounted for 88 cents for each dollar of income, slighly higher compared with 1984. It takes 1.6 years of dairy revenue to recover the 1985 capital investment value.

Management Groups

Every farm operator tries to make management decisions that maximize the return on his farm. In the following table we attempted to identify the top management group and compared them with the standard or average group.

Five factors were selected to measure the level of management:

1. Milk Production Per Cow
2. Total Cost Per Litre of Milk
3. Milk Production For Hour of Labour
4. Milk Production Per Dollar of Feed
5. Milk Production For Dollar Of Investment

The average value for each managment factor was determined for the total sample of producers. The top managment group (25% of producers) consists of producers who exceeded average in at least four factors. In other words the producer who exceeded average in the first four factors and was below average in the fifth factor or any other combination of four factors would qualify for this group.

TABLE 12 MANAGEMENT GROUPS

	STANDARD GROUP	TOP (25%) GROUP
Milk Production Per Cow (L)	6282	7005
Cost For hL of Milk	42.78	38.45
Milk Production Per Work Hour (L)	80.29	100.87
Milk Per Dollar Of Feed (L)	6.11	6.88
Milk Per Dollar Of Capital (L)	1.33	1.49
Butter Fat Test (kg/hL)	3.72	3.67
Feed Cost Per Cow	1028.25	1017.63
Hours of Labour Per Cow	78.24	69.44
Milk/Feed Ratio	2.22	2.41
Investment Per Cow	4726	4705
Per Cent Dry Cows	10.2	11.1
Debt/Capital Ratio	0.34	0.33
Size of Operation (No. Cows)	55.6	63.0
Years Farming	13.5	11.1

The findings, as displayed in Table 12, show the magnitude of the difference between the top group and the standard group. The milk production and cost of production were better by 11.5 and 11.1 per cent, respectively. Along with the five management factors several additional factors are listed for comparison.

APPENDIX A - ALBERTA COMPUTER PRINTOUT

ALBERTA AVERAGE (63)

TABLE 1 : ***** SUMMARY OF DAIRY ENTERPRISE COSTS AND RETURNS *****

	TOTAL ENTERPRISE	PER COW	PER HL. SOLD
------ INCOME ------			
MILK SALES	153937.50	2767.45	45.84
NET MILK SUBSIDY (+-)	-2187.07	-39.32	-0.65
MISCELLANEOUS RECEIPTS	2668.83	47.98	0.79
NET CATTLE SALES (+-)	10026.99	180.26	2.99
NET INVENTORY INCREASE (+-)	-1511.42	-27.17	-0.45
GROSS INCOME	162934.84	2929.20	48.52
----- EXPENSES -----			
GRAIN	7093.74	127.53	2.11
COMPLETE FEED	16800.87	302.04	5.00
SUPPLEMENT	1023.24	18.40	0.30
SALT, MINERALS, VITAMINS	590.98	10.62	0.18
ROUGHAGE	29973.03	538.85	8.93
PASTURE	1558.62	28.02	0.46
PROCESSING COSTS	155.43	2.79	0.05
TOTAL FEED COSTS	57195.91	1028.25	17.03
BEDDING AND SUPPLIES	4361.54	78.41	1.30
VET., MEDICINE AND BREEDING	3890.13	69.94	1.16
ENERGY	6751.89	121.38	2.01
BLDG. & MACH. UPKEEP	5999.65	107.86	1.79
TAXES AND INSURANCE	1749.29	31.45	0.52
MILK HAULING & PROMOTION	8081.64	145.29	2.41
MISCELLANEOUS	3734.69	67.14	1.11
TOTAL OTHER COSTS	34568.82	590.02	10.29
HIRED LABOR	8875.58	159.56	2.64
FAMILY LABOR	20146.18	362.18	6.00
TOTAL LABOR COSTS	29021.76	521.75	8.64
TOTAL OPERATING COSTS	120786.49	2140.02	35.97
RENT	1344.87	24.18	0.40
DEPRECIATION	13275.69	238.67	3.95
INTEREST (CAP.DEBT)	8240.73	148.15	2.45
TOTAL CAPITAL COSTS	22861.30	410.99	6.81
****TOTAL PRODUCTION COST****	143647.78	2551.02	42.78
GROSS RETURN	42148.35	789.18	12.55
RETURN TO EQUITY	19287.05	378.19	5.74
SALE PRICE			45.19
INVENTORY ADJUSTMENT			2.54

ALBERTA AVERAGE (63)

TABLE 2 : ***** MANAGEMENT FACTORS *****

------ PRODUCTIVITY ------		
MILK PRODUCTION PER COW	6282.45	LITRES
MILK PRODUCTION PER WORK HOUR	80.29	LITRES
MILK/FEED RATIO	2.22	LITRES
MILK/CAPITAL RATIO	1.33	LITRES
------- INTENSITY -------		
CONCENTRATE FED PER COW	2.83	TONNES
ROUGHAGE FED PER COW	5.71	TONNES
INVESTMENT PER COW	4725.79	
ACRES OF LAND PER COW	5.93	
LABOR HOURS PER COW	78.24	
------ EFFICIENCY ------		
TOTAL COST PER DOLLAR OF INCOME	0.88	
FEED COST PER DOLLAR OF INCOME	0.35	
LABOR COST PER DOLLAR OF INCOME	0.18	
CAPITAL TURNOVER	1.61	YEARS
---- RATES OF RETURN ----		
EQUITY INTEREST	11.04	%
PAID INTEREST	9.35	%
RETURN TO FAMILY LABOR	6.44	$/HR.
RETURN PER RECEIPTS	11.84	%

ALBERTA AVERAGE (63)

TABLE 3 : STATEMENT OF INVESTMENT

LAND BUILDINGS & EQUIPMENT	% USE TO DAIRY	TOTAL FARM INVESTMENT	AGE	DAIRY INVESTMENT
LAND	2.62	284215.31		7446.27
DAIRY BUILDINGS	100.00	80408.45	9.47	80408.45
CROP BUILDINGS		7196.48		
OTHER BUILDINGS	19.29	53338.35		10291.15
TRACTOR, TRUCK & AUTO.	38.00	56356.20		21416.02
CROP EQUIPMENT		30521.81		
DAIRY EQUIPMENT	100.00	26104.07	6.81	26104.07
OTHER EQUIPMENT	56.86	3001.41		1706.51
TOTAL		541142.08		147372.47
DEPRECIATION		28169.69		13275.69

-- DAIRY LIVESTOCK --	BEGIN YEAR NUMBER	BEGIN YEAR VALUE	END MAR. NUMBER	END MAR. VALUE	AVERAGE VALUE
COWS	57.78	85621.69	56.48	83611.06	84616.37
BRED HEIFERS	14.60	13873.02	15.78	14988.89	14430.95
OPEN HEIFERS	17.16	8579.36	16.14	8071.43	8325.39
HEIFER CALVES	22.73	4630.16	22.57	4618.25	4624.21
BULL CALVES	7.24	361.90	6.06	303.17	332.54
BULLS	0.56	666.67	0.52	628.57	647.62
SUBTOTAL	120.06	113732.79	117.56	112221.37	112977.08
OTHER LIVESTOCK		10442.60		7506.03	8974.32
CROPS & SUPPLIES		29714.09		33367.90	31541.00

TOTAL FARM INVESTMENT	694634.48
CAPITAL LOANS: TOTAL FARM	189157.06
TOTAL DAIRY INVESTMENT	262868.82
CAPITAL LOANS: DAIRY	88132.00
OPERATOR EQUITY: DAIRY	174736.82
DEBT/CAPITAL RATIO	0.34

ALBERTA AVERAGE (63)

TABLE 4 : ***** LABOR AND PRODUCTION REPORT *****

------- LABOR --------	-----DAIRY----- HOURS	VALUE	-----OTHER----- HOURS	VALUE
OPERATOR LABOR	1967.07	15736.57	1236.73	9893.84
HIRED LABOR	1482.95	8875.58	725.44	4341.79
FAMILY UNPAID LABOR	902.17	4409.61	470.49	2299.67
TOTAL	4352.19	29021.76	2432.66	16535.30

-- MILK PRODUCTION ---	HL.	% OF TOTAL	$	AVERAGE VALUE
QUOTA MILK	2552.33	73.04	122408.25	47.96
OVER QUOTA MILK	784.95	22.46	30582.86	38.96
OTHER MILK SALES	3.72	0.11	160.29	43.09
FED CALVES	136.43	3.90	6253.74	45.84
USED IN HOME	17.15	0.49	786.11	45.84
TOTAL	3494.57	100.00	160191.24	45.84

--------OTHER---------	
NUMBER OF DAIRY COWS	55.62
NUMBER OF DRY COWS	10.16
ANIMAL UNITS	87.83
BUTTERFAT TEST	3.72
MAN EQUIVALENTS(DAIRY)	1.74
LABOR COSTS PER HOUR	6.67
CALF CROP (%)	78.50
QUOTA SIZE (L)	707.14
YEARS FARMING	13.46

ALBERTA AVERAGE (63)

TABLE 5 : ***** FEED REPORT *****

CONCENTRATES	PURCHASED QUANTITY (TONNES)	PURCHASED PRICE	PURCHASED VALUE	HOMEGROWN QUANTITY (TONNES)	HOMEGROWN PRICE	HOMEGROWN VALUE
OATS	0.28	115.55	31.83	2.32	110.86	257.72
BARLEY	7.44	129.34	962.25	27.22	111.92	3046.51
WHEAT	0.05	103.00	4.90			
MIXED GRAIN	3.57	95.13	339.57	18.91	106.49	2013.44
(DRY)BREW GRAIN	2.70	133.90	361.17			
BEET PULP	0.50	153.13	76.34			
(DRY) STILLAGE						
SUBTOTAL	14.53		1776.06	48.45		5317.68
DAIRY RATION	87.59	184.60	16168.95			
CALF FEED	2.23	283.08	631.92			
SUPPLEMENT	3.56	287.66	1023.24			
SALT	0.35	238.20	83.88			
MINERALS & VITAMINS	0.90	561.22	507.10			
TOTAL CONCENTRATES	109.16		20191.15	48.45		5317.68
ROUGHAGES						
ALFALFA HAY	96.28	105.77	10184.01	118.54	91.28	10820.59
ALFALFA PELLETS	1.81	153.75	278.12			
STRAW FED	0.28	62.44	17.42	0.23	30.60	7.09
(DRY) SILAGE	8.58	103.93	891.52	83.09	86.20	7163.07
GREENFEED	1.36	65.25	88.56	7.57	69.04	522.64
SUBTOTAL	108.31		11459.63	209.44		18513.39
PASTURE (AUM.)				156.96		1558.62
GRINDING			155.43			
GRAND TOTAL FEED COSTS			31806.22			25389.69
BEDDING STRAW	16.30	33.53	546.53	33.39	30.88	1031.19

APPENDIX B - NORTHERN ALBERTA COMPUTER PRINTOUT

NORTHERN ALBERTA AVERAGE (39)

TABLE 1 : ***** SUMMARY OF DAIRY ENTERPRISE COSTS AND RETURNS *****

	TOTAL ENTERPRISE	PER COW	PER HL. SOLD
------ INCOME ------			
MILK SALES	141345.94	2710.51	45.82
NET MILK SUBSIDY (+-)	-1991.85	-38.20	-0.65
MISCELLANEOUS RECEIPTS	2082.90	39.94	0.68
NET CATTLE SALES (+-)	9033.69	173.23	2.93
NET INVENTORY INCREASE (+-)	-494.14	-9.48	-0.16
GROSS INCOME	149976.54	2876.01	48.62
----- EXPENSES -----			
GRAIN	5967.18	114.43	1.93
COMPLETE FEED	14045.31	269.34	4.55
SUPPLEMENT	763.61	14.64	0.25
SALT, MINERALS, VITAMINS	665.17	12.76	0.22
ROUGHAGE	24820.22	475.96	8.05
PASTURE	1410.85	27.05	0.46
PROCESSING COSTS	199.23	3.82	0.06
TOTAL FEED COSTS	47871.56	918.00	15.52
BEDDING AND SUPPLIES	4274.83	81.98	1.39
VET., MEDICINE AND BREEDING	3311.51	63.50	1.07
ENERGY	6861.89	131.59	2.22
BLDG. & MACH. UPKEEP	6034.92	115.73	1.96
TAXES AND INSURANCE	1816.74	34.84	0.59
MILK HAULING & PROMOTION	7403.21	141.97	2.40
MISCELLANEOUS	3366.57	64.56	1.09
TOTAL OTHER COSTS	33069.69	599.32	10.72
HIRED LABOR	8059.03	154.54	2.61
FAMILY LABOR	21007.81	402.85	6.81
TOTAL LABOR COSTS	29066.84	557.40	9.42
TOTAL OPERATING COSTS	110008.08	2074.72	35.66
RENT	1140.82	21.88	0.37
DEPRECIATION	12668.72	242.94	4.11
INTEREST (CAP.DEBT)	7222.49	138.50	2.34
TOTAL CAPITAL COSTS	21032.03	403.32	6.82
****TOTAL PRODUCTION COST****	131040.11	2478.04	42.48
GROSS RETURN	39968.46	801.29	12.96
RETURN TO EQUITY	18936.43	397.97	6.14
SALE PRICE			45.18
INVENTORY ADJUSTMENT			2.77

NORTHERN ALBERTA AVERAGE (39)

TABLE 2 : ***** MANAGEMENT FACTORS *****

------ PRODUCTIVITY ------		
MILK PRODUCTION PER COW	6104.48	LITRES
MILK PRODUCTION PER WORK HOUR	71.54	LITRES
MILK/FEED RATIO	2.33	LITRES
MILK/CAPITAL RATIO	1.28	LITRES
------- INTENSITY -------		
CONCENTRATE FED PER COW	2.62	TONNES
ROUGHAGE FED PER COW	5.66	TONNES
INVESTMENT PER COW	4754.01	
ACRES OF LAND PER COW	6.55	
LABOR HOURS PER COW	85.33	
------ EFFICIENCY ------		
TOTAL COST PER DOLLAR OF INCOME	0.87	
FEED COST PER DOLLAR OF INCOME	0.32	
LABOR COST PER DOLLAR OF INCOME	0.19	
CAPITAL TURNOVER	1.65	YEARS
---- RATES OF RETURN ----		
EQUITY INTEREST	11.22	%
PAID INTEREST	9.12	%
RETURN TO FAMILY LABOR	6.55	$/HR.
RETURN PER RECEIPTS	12.63	%

NORTHERN ALBERTA AVERAGE (39)

TABLE 3 : STATEMENT OF INVESTMENT

LAND BUILDINGS & EQUIPMENT	% USE TO DAIRY	TOTAL FARM INVESTMENT	AGE	DAIRY INVESTMENT
LAND	2.33	261888.19		6102.20
DAIRY BUILDINGS	100.00	79522.27	9.44	79522.27
CROP BUILDINGS		7140.42		
OTHER BUILDINGS	18.58	53558.22		9950.74
TRACTOR, TRUCK & AUTO.	35.89	54513.51		19563.09
CROP EQUIPMENT		31799.24		
DAIRY EQUIPMENT	100.00	23226.20	6.94	23226.20
OTHER EQUIPMENT	58.38	2331.95		1361.46
TOTAL		513980.00		139725.97
DEPRECIATION		28080.95		12668.72

-- DAIRY LIVESTOCK --	BEGIN YEAR NUMBER	BEGIN YEAR VALUE	END MAR. NUMBER	END MAR. VALUE	AVERAGE VALUE
COWS	54.62	80125.56	54.05	79162.19	79643.87
BRED HEIFERS	12.87	12228.20	14.44	13714.10	12971.15
OPEN HEIFERS	16.82	8410.25	14.67	7333.33	7871.79
HEIFER CALVES	19.21	3976.92	20.21	4208.97	4092.95
BULL CALVES	7.95	397.44	7.59	379.49	388.46
BULLS	0.74	892.31	0.62	738.46	815.38
SUBTOTAL	112.21	106030.69	111.56	105536.54	105783.61
OTHER LIVESTOCK		3294.74		2129.49	2712.12
CROPS & SUPPLIES		24791.89		31320.43	28056.16

TOTAL FARM INVESTMENT	650531.89
CAPITAL LOANS: TOTAL FARM	173742.25
TOTAL DAIRY INVESTMENT	247909.32
CAPITAL LOANS: DAIRY	79201.37
OPERATOR EQUITY: DAIRY	168707.95
DEBT/CAPITAL RATIO	0.32

NORTHERN ALBERTA AVERAGE (39)

TABLE 4 : ***** LABOR AND PRODUCTION REPORT *****

------- LABOR --------	-----DAIRY----- HOURS	VALUE	-----OTHER----- HOURS	VALUE
OPERATOR LABOR	2005.13	16041.03	1304.85	10438.77
HIRED LABOR	1444.50	8059.03	705.22	3934.49
FAMILY UNPAID LABOR	1000.18	4966.78	523.74	2600.85
TOTAL	4449.81	29066.84	2533.81	16974.11

-- MILK PRODUCTION ---	HL.	% OF TOTAL	$	AVERAGE VALUE
QUOTA MILK	2301.46	72.30	110640.00	48.07
OVER QUOTA MILK	768.00	24.13	30022.12	39.09
OTHER MILK SALES	1.70	0.05	65.83	38.75
FED CALVES	98.69	3.10	4522.06	45.82
USED IN HOME	13.49	0.42	617.98	45.82
TOTAL	3183.33	100.00	145868.00	45.82

--------OTHER---------	
NUMBER OF DAIRY COWS	52.15
NUMBER OF DRY COWS	8.68
ANIMAL UNITS	83.33
BUTTERFAT TEST	3.76
MAN EQUIVALENTS(DAIRY)	1.78
LABOR COSTS PER HOUR	6.53
CALF CROP (%)	84.33
QUOTA SIZE (L)	653.72
YEARS FARMING	13.38

NORTHERN ALBERTA AVERAGE (39)

TABLE 5 : ***** FEED REPORT *****

CONCENTRATES	PURCHASED QUANTITY (TONNES)	PURCHASED PRICE	PURCHASED VALUE	HOMEGROWN QUANTITY (TONNES)	HOMEGROWN PRICE	HOMEGROWN VALUE
OATS	0.45	115.55	51.42	2.13	103.74	220.53
BARLEY	3.76	118.98	447.26	22.87	108.07	2471.51
WHEAT						
MIXED GRAIN	5.77	95.13	548.54	18.78	106.83	2006.23
(DRY)BREW GRAIN	1.63	132.31	215.48			
BEET PULP	0.03	240.80	6.20			
(DRY) STILLAGE						
SUBTOTAL	11.62		1268.90	43.78		4698.28
DAIRY RATION	75.83	180.04	13652.15			
CALF FEED	1.37	287.66	393.16			
SUPPLEMENT	2.46	310.18	763.61			
SALT	0.44	242.77	107.74			
MINERALS & VITAMINS	1.00	560.18	557.42			
TOTAL CONCENTRATES	92.72		16742.99	43.78		4698.28
ROUGHAGES						
ALFALFA HAY	77.30	87.53	6766.28	134.65	85.21	11474.29
ALFALFA PELLETS	0.96	184.40	177.68			
STRAW FED	0.20	64.52	12.92	0.25	29.39	7.31
(DRY) SILAGE	4.96	97.87	485.69	71.97	77.94	5609.27
GREENFEED	0.21	49.00	10.05	4.56	60.63	276.72
SUBTOTAL	83.63		7452.63	211.43		17367.59
PASTURE (AUM.)				142.85		1410.85
GRINDING			199.23			
GRAND TOTAL FEED COSTS			24394.84			23476.71
BEDDING STRAW	13.31	28.82	383.45	35.46	31.00	1099.10

APPENDIX C - SOUTHERN ALBERTA COMPUTER PRINTOUT

SOUTHERN ALBERTA AVERAGE (24)

TABLE 1 : ***** SUMMARY OF DAIRY ENTERPRISE COSTS AND RETURNS *****

	TOTAL ENTERPRISE	PER COW	PER HL. SOLD
------ INCOME ------			
MILK SALES	174400.99	2846.23	45.86
NET MILK SUBSIDY (+-)	-2504.29	-40.87	-0.66
MISCELLANEOUS RECEIPTS	3620.96	59.09	0.95
NET CATTLE SALES (+-)	11641.08	189.98	3.06
NET INVENTORY INCREASE (+-)	-3164.52	-51.65	-0.83
GROSS INCOME	183994.22	3002.80	48.39
----- EXPENSES -----			
GRAIN	8924.44	145.65	2.35
COMPLETE FEED	21278.66	347.27	5.60
SUPPLEMENT	1445.14	23.58	0.38
SALT, MINERALS, VITAMINS	470.45	7.68	0.12
ROUGHAGE	38346.36	625.81	10.08
PASTURE	1798.75	29.36	0.47
PROCESSING COSTS	84.25	1.37	0.02
TOTAL FEED COSTS	72348.04	1180.72	19.03
BEDDING AND SUPPLIES	4502.45	73.48	1.18
VET., MEDICINE AND BREEDING	4830.37	78.83	1.27
ENERGY	6573.12	107.27	1.73
BLDG. & MACH. UPKEEP	5942.33	96.98	1.56
TAXES AND INSURANCE	1639.67	26.76	0.43
MILK HAULING & PROMOTION	9184.16	149.89	2.42
MISCELLANEOUS	4332.87	70.71	1.14
TOTAL OTHER COSTS	37004.97	577.16	9.73
HIRED LABOR	10200.90	166.48	2.68
FAMILY LABOR	18778.69	306.47	4.94
TOTAL LABOR COSTS	28979.59	472.95	7.62
TOTAL OPERATING COSTS	138332.60	2230.84	36.38
RENT	1676.46	27.36	0.44
DEPRECIATION	14259.98	232.72	3.75
INTEREST (CAP.DEBT)	9910.60	161.74	2.61
TOTAL CAPITAL COSTS	25847.04	421.83	6.80
****TOTAL PRODUCTION COST****	164179.63	2652.66	43.18
GROSS RETURN	45661.62	771.96	12.01
RETURN TO EQUITY	19814.59	350.13	5.21
SALE PRICE			45.21
INVENTORY ADJUSTMENT			2.23

SOUTHERN ALBERTA AVERAGE (24)

TABLE 2 : ***** MANAGEMENT FACTORS *****

------ PRODUCTIVITY ------		
MILK PRODUCTION PER COW	6528.57	LITRES
MILK PRODUCTION PER WORK HOUR	95.39	LITRES
MILK/FEED RATIO	2.08	LITRES
MILK/CAPITAL RATIO	1.39	LITRES
------- INTENSITY -------		
CONCENTRATE FED PER COW	3.13	TONNES
ROUGHAGE FED PER COW	5.79	TONNES
INVESTMENT PER COW	4688.33	
ACRES OF LAND PER COW	5.09	
LABOR HOURS PER COW	68.44	
------ EFFICIENCY ------		
TOTAL COST PER DOLLAR OF INCOME	0.89	
FEED COST PER DOLLAR OF INCOME	0.39	
LABOR COST PER DOLLAR OF INCOME	0.16	
CAPITAL TURNOVER	1.56	YEARS
---- RATES OF RETURN ----		
EQUITY INTEREST	10.73	%
PAID INTEREST	9.66	%
RETURN TO FAMILY LABOR	6.21	$/HR.
RETURN PER RECEIPTS	10.77	%

SOUTHERN ALBERTA AVERAGE (24)

TABLE 3 : STATEMENT OF INVESTMENT

LAND BUILDINGS & EQUIPMENT	% USE TO DAIRY	TOTAL FARM INVESTMENT	AGE	DAIRY INVESTMENT
LAND	3.00	320497.50		9630.37
DAIRY BUILDINGS	100.00	81848.43	9.52	81848.43
CROP BUILDINGS		7287.59		
OTHER BUILDINGS	20.52	52981.12		10870.97
TRACTOR, TRUCK & AUTO.	41.27	59350.66		24495.38
CROP EQUIPMENT		28445.97		
DAIRY EQUIPMENT	100.00	30780.61	6.59	30780.61
OTHER EQUIPMENT	55.47	4089.27		2268.46
TOTAL		585281.13		159894.22
DEPRECIATION		28313.91		14259.98

	-----BEGIN YEAR-----		-----END MAR.-----		AVERAGE
-- DAIRY LIVESTOCK --	NUMBER	VALUE	NUMBER	VALUE	VALUE
COWS	62.92	94552.94	60.42	90840.50	92696.72
BRED HEIFERS	17.42	16545.83	17.96	17060.41	16803.12
OPEN HEIFERS	17.71	8854.16	18.54	9270.83	9062.50
HEIFER CALVES	28.46	5691.66	26.42	5283.33	5487.50
BULL CALVES	6.08	304.17	3.58	179.17	241.67
BULLS	0.25	300.00	0.38	450.00	375.00
SUBTOTAL	132.83	126248.76	127.29	123084.24	124666.50
OTHER LIVESTOCK		22057.87		16242.91	19150.39
CROPS & SUPPLIES		37712.66		36695.04	37203.85

TOTAL FARM INVESTMENT	766301.88
CAPITAL LOANS: TOTAL FARM	214206.00
TOTAL DAIRY INVESTMENT	287274.24
CAPITAL LOANS: DAIRY	102644.12
OPERATOR EQUITY: DAIRY	184630.12
DEBT/CAPITAL RATIO	0.36

SOUTHERN ALBERTA AVERAGE (24)

TABLE 4 : ***** LABOR AND PRODUCTION REPORT *****

------- LABOR --------	-----DAIRY----- HOURS	VALUE	-----OTHER----- HOURS	VALUE
OPERATOR LABOR	1905.23	15241.83	1126.04	9008.33
HIRED LABOR	1545.44	10200.90	758.29	5005.22
FAMILY UNPAID LABOR	742.90	3536.86	383.96	1827.99
TOTAL	4193.56	28979.59	2268.29	15841.54

-- MILK PRODUCTION ---	HL.	% OF TOTAL	$	AVERAGE VALUE
QUOTA MILK	2959.99	73.99	141532.25	47.82
OVER QUOTA MILK	812.49	20.31	31495.47	38.76
OTHER MILK SALES	7.00	0.18	313.77	44.81
FED CALVES	197.75	4.94	9069.59	45.86
USED IN HOME	23.10	0.58	1059.49	45.86
TOTAL	4000.33	100.00	183470.57	45.86

--------OTHER---------	
NUMBER OF DAIRY COWS	61.27
NUMBER OF DRY COWS	12.57
ANIMAL UNITS	95.12
BUTTERFAT TEST	3.67
MAN EQUIVALENTS(DAIRY)	1.68
LABOR COSTS PER HOUR	6.91
CALF CROP (%)	70.45
QUOTA SIZE (L)	793.96
YEARS FARMING	13.57

SOUTHERN ALBERTA AVERAGE (24)

TABLE 5 : ***** FEED REPORT *****

CONCENTRATES	PURCHASED QUANTITY (TONNES)	PURCHASED PRICE	PURCHASED VALUE	HOMEGROWN QUANTITY (TONNES)	HOMEGROWN PRICE	HOMEGROWN VALUE
OATS				2.65	120.16	318.17
BARLEY	13.42	134.06	1799.12	34.29	116.09	3980.90
WHEAT	0.13	103.00	12.88			
MIXED GRAIN				19.11	105.95	2025.17
(DRY)BREW GRAIN	4.43	134.85	597.91			
BEET PULP	1.27	150.23	190.31			
(DRY) STILLAGE						
SUBTOTAL	19.25		2600.21	56.05		6324.24
DAIRY RATION	106.69	189.88	20258.76			
CALF FEED	3.64	280.29	1019.90			
SUPPLEMENT	5.34	270.77	1445.14			
SALT	0.20	222.01	45.11			
MINERALS & VITAMINS	0.75	563.43	425.33			
TOTAL CONCENTRATES	135.87		25794.44	56.05		6324.24
ROUGHAGES						
ALFALFA HAY	127.14	123.79	15737.84	92.37	105.65	9758.34
ALFALFA PELLETS	3.18	138.67	441.33			
STRAW FED	0.41	60.77	24.74	0.20	33.00	6.74
(DRY) SILAGE	14.45	107.31	1551.00	101.17	95.76	9687.98
GREENFEED	3.23	66.93	216.12	12.45	74.05	922.27
SUBTOTAL	148.41		17971.03	206.20		20375.33
PASTURE (AUM.)				179.87		1798.75
GRINDING			84.25			
GRAND TOTAL FEED COSTS			43849.72			28498.31
BEDDING STRAW	21.16	38.35	811.53	30.04	30.66	920.84

APPENDIX D - MONTHLY QUESTIONNAIRE

Q1

Production Economics Branch
7000 - 113 Street
Edmonton, Alberta
T6H 5T6
Tel: 427-5397 or 427-4003

DAIRY STUDY MONTHLY QUESTIONNAIRE

Name:_____ Month:_____ Year:_____

ALL INDIVIDUAL ACCOUNTS WILL BE KEPT CONFIDENTIAL.

Use your own actual situation and experience to estimate proportions to dairy as indicated. The dairy enterprise means everything associated with milking and dry cows and dairy young stock. It is important that the information be provided each month. Your milk production and values are obtained from the milk statements by this office.

Question	Total Farm	Dairy Portion
1. Liters of Milk sold other than to plant	XXXX	
2. Value of milk sold other than to plant	XXXX	
3. Liters of milk fed to young stock (not colostrum)	XXXX	
4. Liters of milk used in home	XXXX	
5. Veterinary, medicine and breeding expenses		
6. Livestock and dairy supplies		
7. Building, hardware, fence - repairs		
8. Dairy equipment - repairs	XXXXX	
9. Field equipment - repairs		XXXXX
10. Tractor, Truck - repairs (Estimate dairy portion_____%)		
11. Fuel, oil, grease (Estimate dairy portion_____%)		
12. Utilities (Estimate dairy portion_____%)		
13. Taxes paid this month		
14. Cash rent paid this month for:_____		
15. Insurances and Licenses (Dairy_____%)		
16. Interest only on Capital Loans (exclude principle)		
17. Interest only on Operating Loans (Dairy Portion _____%)		
18. Seed and Crop supplies (twine etc.)		XXXXX
19. Fertilizer and chemicals		XXXXX
20. Custom charges and other services for:_____		
21. Other Expenses (DHIA, Legal, Accounting etc.)		
22. Feed Puschases		
23. Feed grinding Charges		
24. a) Government Subsidies for milk	XXXX	
b) Other Government Subsidies		
c) C.W.B. Payment		XXXX
d) Crop Sales		XXXX
e) Misc. Income, specify:_____		

25. **Labour Situation this Month:**

		Dairy Chores	Other Work	Wages Paid incl. Board
a. Operator	Hr./day	____ x ____ days ____	Hr/day ____ x ____ days ____	XXXXX
b. Hired and Paid Family	1st) Hours	____ x ____ days ____	Hours ____ x ____ days ____	
	2nd) Hours	____ x ____ days ____	Hours ____ x ____ days ____	
	3rd) Hours	____ x ____ days ____	Hours ____ x ____ days ____	
	4th) Hours	____ x ____ days ____	Hours ____ x ____ days ____	
c. Unpaid Labor	1st) Hours	____ x ____ days ____	Hours ____ x ____ days ____	XXXXX
	2nd) Hours	____ x ____ days ____	Hours ____ x ____ days ____	XXXXX

26. Dairy Herd	Begin. No.	Sold No.	Sold Value	Purchased No.	Purchased Value	Home Use No.	Home Use Value	Trans. to Beef No.	Trans. to Beef Value	Born No.	Death No.	End No.
Dairy Cows Milking + Dry												
Bred Heifers												
Open Heifers												
Heifer Calves Under 12 mon.												
Bull Calves Under 7 mon.												
Herd Bulls												
Totals												

27. Other Livestock (beef, etc.): Sold $_____ Purchased $_____ Home Use $_____

28. Milking Cows Only No._____

29. Feed Fed to Dairy Herd:

		Quantity of Feed Fed: weight per day	x	no. days	-or- weight per month	Price if Purchased (per weight unit)
1.	Bedding Straw		x			$ ____/____
2.			x			$ ____/____
3.			x			$ ____/____
4.			x			$ ____/____
5.			x			$ ____/____
6.			x			$ ____/____
7.			x			$ ____/____
8.			x			$ ____/____
9.			x			$ ____/____

30. No. of dairy animals on pasture: Cows _____ Heifers _____ Calves _____

	Total Farm	Dairy Portion
31. Dairy equipment: a. purchases (specify: _____)		
b. sales (specify: _____)		
32. Field equipment: a. purchases (specify: _____)		XXXXX
b. sales (specify: _____)		XXXXX
33. Tractor, truck, auto. a. purchases (specify: _____)		
b. sales (specify: _____)		
34. a. Total cost for new bldg. (specify: _____)		
b. Buildings sold this month (specify: _____)		
35. Land: sold _____ acres, purchased _____ acres		XXXXX
36. Milk Quota: sold _____ Lit. purchased _____ Lit.		

APPENDIX E - ALBERTA PRICE FORMULA

PRICING MILK BY FORMULA

Milk sold for consumption in fluid form in Alberta is priced at the producer, wholesale and retail levels by the Board of Public Utilities. This is a common procedure, in that for many years, appointed bodies in Canada and the U.S.A. have issued pricing orders designed to ensure adequate supplies of milk for the consuming public. The orders are made, following public hearings at which producers, consumer and industry representatives make submission. All systems incorporate some type of quota allocation among milk producers, which when associated with the first grade milk price, provides the incentive to maintain the flow of milk in the cold winter months as well as in the summer.

Formula Pricing

A modification of the above procedure is known as "formula pricing" whereby an equitable price for first grade milk is determined through the use of selected statistical indicators. As milk is considered an essential food in the modern diet, the interests of consumers as well as producers must be considered in the pricing mechanism. Thus an "economic formula", incorporating supply and demand components, is normally used, to determine the producer price.

Formula Development in Alberta

In 1973, the Production & Resource Economics Branch designed a formula process to permit a comparison with milk price levels over the previous ten years. It was adopted for experimentation over a 12 month period from August, 1973 to August, 1974. Upon presentation and discussion of the results at a hearing in Red Deer in August, 1974, the Utility Board ordered the Formula to be used as a pricing mechanism for a test period of one year starting in October, and to be accompanied with a cost of production program to monitor its suitability and to assess adjustments in the formula components, if required at the end of the period.

The Alberta Formula

The Alberta Formula consists of seven statistical factors or components. The first five represent producer's major cost components and return, and therefore are a reflection of his willingness to sell. The last two represent the approximation of demand of the consumers. The weight given to each factor was established with reference to the actual cost structure on the supply side and relative demand elasticities was a guide for setting the weight of the demand side.

TABLE 1
Components of the Alberta Formula

Components		Weighting
1.	Price of 16% dairy feed $/Tonne (Alberta)	14
2.	Price of Alfalfa Hay $/Ton (Alberta)	14
3.	Index of Farm Wages (Western Canada)	12
4.	Index of Farm Inputs (Western Canada)	20
5.	Index of Consumer Prices (Canada)	10
6.	Average Weekly Industrial Wages (Alberta)	16
7.	Per Capita Sales of Milk Litres/Month (Alberta)	14
	COMPOSITE	100

Application

A base price of $21.04 per hectolitre for No. 1 milk was established as at August, 1973. This was determined from the results of the 1973 Dairy Cost Study and provided for a return of 15 per cent on sales income. The indicies for the month of August, 1973 were converted to 100, which was then equated to the base price of $21.04. Subsequent monthly index conversions were then calculated relative to the base month, and subsequent monthly producer price levels were determined by multiplying the base price by the appropriate "combined indices".

Whenever the present Formula states a change of $0.49 per hl. above or below the existing No. 1 producer price, the Board of Public Utilities may make an adjustment of $0.98 to the producer and one cent per litre to the consumer.

Changes in the Formula price are calculated monthly by the Production & Resource Economics Branch, and are forwarded to the Public Utilities Board in time to allow for notifications and price list adjustment by the milk processing firms for the succeeding month.

The current formula will be kept under observation and, subject to results of the cost study and observed statistical trends, will be reviewed from time to time.

ALBERTA AGRICULTURE
PRODUCTION & RESOURCE ECONOMICS BRANCH
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